Grain Handling Terms

1 Belt/Conveyor. Grain moving devices that transport grain in a horizontal or inclined direction. Usually constructed of an endless rubberized belt that moves over rollers, between a motor-driven head pulley, and a nonmotorized tail pulley.

2. Bin Floor. Name commonly given to the area directly above shipping and/or storage bins. The bin floor usually contains a variety of chutes, spouts, conveyor belts and trippers that allow grain to be moved to various parts of the facility.

3 Boot. The covering (usually metal) around the bottom of an elevator leg. Grain is thrown off a horizontal conveyor belt into the boot where it is scooped up by buckets attached to the vertical elevator leg. The boot may be located in a sunken portion of elevator floor, referred to as the "boot pit."

4. Boxcar. A carrier used to transport grain by rail. Access doors for loading and unloading are located on each side and require specialized loading and unloading equipment and procedures.

5 Carrier. A truck, trailer, truck/trailer combination, railcar, barge, ship, or other container used to transport bulk or sacked grain.

6 Container. A bin or other storage space, bag, box, or other receptacle for grain.

7 Delivery System. A system used to deliver inbound grain from the carrier to the scale or to deliver outbound grain from the scale to the carrier. The delivery system includes all belts, pits, bins, legs, chutes, and spouts through which the grain will travel in order to reach its intended destination.

8 Distributor. A piece of equipment used to direct grain to any of several conveyors or spouts. The distributor can be a movable spout or a movable turnhead that is positioned over a number of stationary spouts or chutes.

9 Diversion Point. Any point in the delivery system where the direction of the grain flow can be changed. Diversion points existing in a facility define the scale's delivery system and are prime areas for spills and leaks.

10. Diverter-Type Mechanical Sampler. A mechanical grain sampling device that periodically removes a proportional amount of grain from the flow for inspection purposes.

11. Draft. That which is weighed in one weighing operation, especially on a large-capacity scale.

12. Elevator Legs. Vertical conveyor belts (usually enclosed in a metal covering) that lift grain through the facility by means buckets made of various materials.

13. Elevator Facility Handbook. The guide to a facility which provides official personnel with detailed information on the facility in which they work.

14. Floating Rigs. A waterborne grain handling and weighing system used to remove and weigh grain from barges directly to other waterborne carriers.

15. Gallery. An elevated structure that houses shipping belts and trippers that direct grain through spouts to vessels or barges. In some locals, the diverter-type mechanical sampler is also located in the gallery.

16. Garner. A temporary holding area above or below the weigh hopper included in the grain weighing system to allow for continuous grain flow.

17. Grain Cleaning Apparatus. Devices that remove nongrain material or that clean grain for shipment or storage. Cleaners that remove large pieces of metal, wood, and other nongrain foreign material from the grain are usually called "scalpers." Cleaners that remove fine grain particles or dirt from grain are often called "shakers" and operate with a series of screens that separate fine particles as the grain passes over the screens.

18. Grain Flow Security. Measures taken by official personnel to guard against grain losses and verify grain movement throughout a facility's grain weighing and delivery system.

19. Head Floor. Name given to an elevator floor where elevator legs turn and deposit grain into garners above weigh hoppers. In many facilities, grain cleaning equipment is also located on the head floor. The head floor is usually the top most floor of the elevator building.

20. Hopper Car. A carrier used to transport grain by rail. Hopper cars have access doors for loading on the top and are unloaded by opening slides at the bottom of the cars.

21. Limit Switches. Mechanically activated switches used to indicate the position of slides, gates, and valves.

22. Permissive (Official). A term used in this handbook referencing a physical release, indication, or response by official personnel to maintain grain flow security e.g., response to an equipment failure alarm, releasing the control of equipment, consent to proceed to the next level of loading or unloading.

23. Permissive Device. Grain flow devices which have to be disengaged by official personnel before facilities may control use of elevator equipment.

24. Scale Floor. The area of the elevator building that contains weigh hoppers and weighing equipment. In most elevators, the scale floor is directly below the upper garners of the head floor.

25. Seals. A security device that allows official personnel to secure and monitor the flow of grain in areas where they are not permanently stationed.

26. Shipping Bins. Temporary holding bins for grain intended for shipment. Shipping bins are usually smaller than elevator storage bins and can be used to hold ship sublots for inspection purposes.

27. Slides/Gates. Control devices that give elevator personnel the ability to change the direction of grain flow. Slides and gates are usually found at the bottom of shipping and storage bins, junction of spouts, and in some trippers.

28. Spout. A cylindrical or rectangular chute through which grain passes while being loaded aboard a vessel or into other carriers. Spouts can also be used within the elevator to direct grain to other types of delivery systems.

29. Surge Bins. Small temporary holding bins that allow the elevator to quickly shut off the grain supply (when located in the gallery) or allows the weigh hopper to discharge quickly.

30. Tripper. A movable device for directing grain. Trippers are used on conveyor belts to direct grain into storage or shipping bins or to direct grain into a number of different loading spouts. There can be more than one tripper on a conveyor belt.

31. Trolley Spout. A spout located beneath the weigh hopper that can be moved to various positions, directing grain to different locations in the elevator.

32. Unit Train. A group of hopper cars weighed and certified as one lot. Unit trains may have a specific identification name or number or may be identified using the identification of the hopper cars comprising the unit train.

33. Valves. A device used to direct, limit, or seal off the flow of grain at any given point. There are several kinds of valves, these include: (1) Basket valves, which control a flat plate that swings on pivots right or left to close off one side or the other of a spout; (2) slide valves, which control the flow of grain through a spout by means of a sliding plate; and (3) clam shell valves, comprised of two half-plates that swing in an arc and bite together to either completely or partially close off a spout.

34. Weighback Spout. A movable or stationary device through which grain in shipping bins is directed back into elevator legs for reweighing.

A. Official Personnel/Certification Terms

NOTE: Certification Procedures are found in Chapter 2 of this handbook.

1. Agricultural Marketing Act (AMA). A law passed by Congress to facilitate the marketing and distribution of agricultural products.

2. Combined Lots. Grain loaded aboard or being loaded aboard or discharged from two or more carriers.

3. Conversion Factor. Any mathematical factor used to convert one form of measured units to another.

4. Cutoff. A requested ending of the weighing and or inspection of grain for shipment prior to completing the loading. An official certificate is issued for grain weighed before the cutoff and for the grain weighed after the cutoff. The portions shall be treated as separate lots.

5. Delegated Agency. A State agency delegated authority under the Act to perform official inspection functions and official Class X weighing functions at one or more export port locations in the State.

6. Designated Agency. A State or local Government agency or person designated by the Service to perform all or specified official inspection functions and/or official Class X weighing functions at locations other than export port locations.

7. Grain Additives. Material approved by the Food and Drug Administration (FDA) or the Environmental Protection Agency (EPA) and added to grain for the purposes of insect and fungi control, dust suppression, or identification.

8. Intercompany Grain Movement. Movement of grain from a facility belonging to one party to another facility belonging to a different party.

9. Intracompany Grain Movement. Movement of grain from a facility belonging to one party to another facility belonging to the same party.

10. Key Control. Measures taken to safeguard and provide accountability for keys to padlocks used in the grain flow security system.

11. Local Movement. Movement of grain within a single facility.

12. Agency. Any State or local Government agency, or any person, designated by the Administrator pursuant to subsection (f) of Section 7 of the Act for the conduct of official inspection (other than appeal inspection), or subsection (c) of Section 7A of the Act for the conduct of Class X or Class Y weighing (other than review of weighing).

13. Master key. A single key that will unlock a group of similar locks used in the grain flow security system.

14. Official personnel. Persons licensed or otherwise authorized by the Administrator pursuant to Section 8 of the Act to perform all or specified functions involved in official inspection, Class X or Class Y weighing, or in the supervision of official inspection or Class X or Class Y weighing.

15. Official weighing. (Referred to as Class X weighing.) The determination and certification by official personnel of the quantity of a lot of grain under standards provided for in the Act, based on the actual performance of weighing or the physical supervision thereof, including the physical inspection and testing for accuracy of the weights and scales and the physical inspection of the premises at which the weighing is performed and the monitoring of the discharge of grain into the elevator or conveyance. (The terms "officially weigh" and "officially weighed" shall be construed accordingly.)

16. Postloading Survey. An examination of a carrier and delivery system to assure that all grain weighed for a carrier was entirely delivered to the carrier.

17. Postunloading Survey. An examination of a carrier and delivery system to assure that grain in an identifiable carrier was properly removed from the carrier and entirely delivered to the scale.

18. Preloading Survey. An examination of a carrier for any condition that might affect its ability to carry grain and of the delivery system to assure that all grain weighed for a carrier is entirely delivered to the carrier.

19. Preunloading Survey. An examination of a carrier for any condition that may have affected its ability to transport grain and of the delivery system to assure that all grain removed from the carrier is entirely delivered to the scale.

20. Regulations. The official rules as formulated for the purpose of implementing the United States Grain Standards Act (7 CFR 800, 801, and 802).

21. Reject and Return (R&R). Term used to describe the return of grain to elevator storage which does not meet load order requirements.

22. Scale Official. An employee of the Service or delegated State official who is responsible for the weighing systems at locations as assigned. He/she should be consulted for any scale problems or possible malfunctions.

23. Shift Supervisor. An individual responsible for the day-to-day weighing and inspection activities of official personnel at locations as assigned.

24. Spill. A loss of grain during loading or unloading of a carrier.

25. Spill Estimation Charts. Tables based on the spill formulas that offer a quick and reliable method for the estimation of spills.

26. Spill Estimation Formulas. Geometric formulas which compute the volume of various shapes, convert that volume to bushels and then to pounds.

27. Stowage Examination. An examination of the stowage spaces of a carrier conducted by official personnel to determine the suitability of a carrier or container to receive and store grain.

28. Sublot. A proportional amount of a lot collected and examined by official personnel for the purpose of determining the uniformity and quality of the grain.

29. Supervision of weighing. (Referred to as Class Y weighing.) Such supervision by official personnel of the grain-weighing process as is determined by the Administrator to be adequate to reasonably assure the integrity and accuracy of the weighing and of certificates which set forth the weight of the grain and such physical inspection by such personnel of the premises at which the grain weighing is performed as will reasonably assure that all the grain intended to be weighed has been weighed and discharged into the elevator or conveyance.

30. Test Weight. The weight in pounds per Winchester bushel as determined on an approved device.

31. Trade Weight. Standard test weights used for estimating quantities of grain when exact test weights are not known.

32. United States Grain Standards Act (USGSA). A law passed by Congress that provides a system by which grain may be marketed in an orderly and timely manner, and trading in grain may be facilitated.

33. Weighback. A procedure used when grain must be returned to the elevator and its exact weight is not known.

34. Official weigher. Official personnel who perform or supervise the performance of Class X or Class Y weighing services and certify the results thereof including the weight of the grain.

B. Scale Systems Terms.

1. Balance Indicator. A combination of elements, one or both of which will oscillate with respect to the other, for indicating the balance condition of a nonautomatic-indicating scale. The combination may consist of two indicating edges, lines, or points, or a single edge, line, or point and a graduated scale.

2. Battery Back-up. A mechanism in electronic weighing systems that allows the information to be retained in the event of a loss of power.

3. Bindicator. A switch in bins that indicates the level of grain. A bindicator may be used in some instances to verify the cleanout of shipping bins.

4. Calibration Value. Some electronic systems are equipped with a calibration button which, when pressed, displays figures in the digital display. The displayed figure is known as the "Calibration Value" and should not vary from the value posted on the console.

5. Certified Capacity. The maximum weight limit that has been approved by the Service for a scale for weighing under the Act. It is posted on the scales nomenclature plate.

6. Control Board. A scaled down diagram of the facility's grain flow system indicating belts, legs, scales, and distributing areas. It may contain indicating lights and controls for equipment used to direct grain flow.

7. Control Room. Houses consoles, printers, and control boards. It may be located within the facility or removed from it.

8. Counterbalance Hanger. A removable hanger designed to be hung from the extreme butt pivot of a weighbeam to receive counterbalance weights as needed to balance the scale under zero load.

9. Counterpoise Type-Registering Weighbeam Scale. A manual weighbeam scale that requires the scale ticket to be punched twice, once at the counterpoise weight (for thousands of pounds), and once at the fractional poise (for less than 1,000 pounds).

10. Dead Load. The fixed force of the weighbridge, platform, and other load supporting structures of the scale. The dead load is permanently balanced or canceled out in the weight indicating or measuring system.

11. Digital Instrument. Receives input from the operator and receives and processes information received from load cells, limit switches, and the printer.

12. Draft. The amount of grain weighed in one weighing cycle.

13. Fractional Poise. Part of a counterpoise type-registering scale located on the weighbeam which indicates weights of less than 1,000 pounds.

14. Full-Capacity Type-Registering Scale. A manual weighbeam scale which registers the full weight of the contents of the scale at the poise on the weighbeam. With this type of scale, there are no counterpoise weights.

15. Full Electronic Scale. Uses only load cells (as opposed to load cells and levers) to register the weight of the scale's contents. The load cell converts force into an electrical signal proportional to the weight.

16. Gross Weight. The weight of a quantity of grain including the container or carrier.

17. Indicator Lights. Lights which, when activated, show the position of a slide, gate, belt, or scale (i.e., belt running, slide closed or open). Indicator lights are usually connected to switches.

18. Inspection Doors. Doors which allow access to weigh hoppers, bins, or garners for the purpose of inspecting the areas inside.

19. Levertronic Scale. Uses a system of load cell(s) and levers to register the weight of the scale's contents. The load cell(s) converts force into an electrical signal proportional to the weight.

20. Limited Access Areas. Areas in the console and/or printer of electronic systems that allows manipulation of switches and controls that can affect the automatic operation or digital readout.

21. Load Cell. A device which produces an output signal proportional to the applied load. The load cell may utilize any physical principle in the field of, but not limited to, electronics, hydraulics, magnetics, and pneumatics or combinations thereof.

22. Load-Receiving Element. That element of a scale which is designed to receive the load to be weighed. For example; platform, deck, rail, hopper.

23. Malfunction. With respect to official weighing, any occurrence that provides inaccurate or unverifiable weight information.

24. Minimum Division. The smallest unit in which a weighing device can register a weight.

25. Motion Detection. The process of sensing a rate of change of applied load to determine when a given weighing system has reached state of equilibrium

26. Net Weight. The weight of quantity of grain exclusive of the container or carrier.

27. Overdraft. Any draft that exceeds the certified capacity of the scale.

28. Poise. A movable weight mounted upon or suspended from a weighbeam bar and used in combination with graduations and, frequently, with notches on the bar to indicate weight values.

29. Preset Tare. A reference amount that represents an empty scale condition.

30. Printer. An instrument that records Alpha and/or Numeric information

31 Process Control. Feature of an electronic weighing system that can, in the automatic mode, control the garner and weigh hopper gates, the digital display, the printing functions, and will repeat in succession without involving the human operator.

32. Radio Frequency Interference (RFI). Radio frequency is a type of electrical disturbance which, when introduced into electronic and electrical circuits, may cause deviations from the normally expected performance.

33. Railway Track Scale. A scale especially designed to weigh railcars.

34. Scale Component. Any part of the unit which weighs grain including levers, load cells, and the weigh hopper itself.

35. Scale Tape. A continuous sheet of paper on which weight information is printed Scale tapes are part of the documentation used to support official weighing results.

36. Scale Ticket. Small strips of paper or cardboard on which an impression from a manual scale provides a print of gross and tare weights. Scale tickets are part of the documentation used to support official weighing results.

37. Sensitivity Requirement (SR). A performance requirement for a nonautomatic indicating scale; specifically, the minimum change in the position of rest of the indicating element of the scale in response to the increase or decrease, by a specified amount, of the test-weight load on the load-receiving element of the scale.

38. Settling Time. The amount of time required for a scale to stop fluctuating prior to printing a gross or tare weight.

39. Stops. Elements of a manual weighbeam scale which prevent movement of poises behind the zero division when balancing or weighing.

40. Tare Bars. A weighbeam bar intended primarily for use in setting off or balancing the weight of an empty container, vehicle, etc.

41. Tare Weight. The weight of an empty container or vehicle. Also called "light weight" with respect to a container or vehicle.

42. Trig Loop. The fixture through which the tip of the weighbeam projects in usual construction designed to restrict vertical angular motion of the weighbeam to designed limits.

43. Vehicle/Truck Scale. A scale designed for use in determining the weight of bulk grain in a motorized vehicle or in a trailer drawn by a motorized vehicle

44. Warmup Period. When the power supply to an electronic weighing system has been shut off, a warmup period of from a 1/2 to 1 hour is required before official weighing can begin on the scale or scales.

45. Weighment. A single complete weighing operation.

46. Weighbeam. An element comprising one or more bars equipped with movable poises or means for applying counterpoise weights or both.

47. Weighbeam Shelf. On a manual scale, the horizontal platform directly beneath the beam which supports the beam.

48. Zero-Load Balance. A representation of zero when there is no load on the load receiving element.

C. Sacked Grain Terms.

1. Carrier. A truck, trailer, truck/trailer combination, railroad car, barge, ship or other container used to transport bulk or sacked grain.

2. Checkloading. Determining that the carrier is suitable to receive grain, counting

the containers of grain loaded into the carrier, observing the condition of containers, and monitoring the disposition of grain spilled from torn and leaking sacks.

3. Container. A bin or other storage space, bag, box, or other receptacle for grain.

4. Gross Weight. The overall weight of the filled container which includes the weight of all packing components and the grain.

5. Lot. A specific quantity of grain identified as such.

6. Lot Size. The number of containers in the lot.

7. Net Weight. The actual weight of grain minus the container and packing components.

8. Official personnel. Persons licensed or otherwise authorized by the Administrator pursuant to Section 8 of the Act to perform all or specified functions involved in official inspection, Class X or Class Y weighing, or in the supervision of official inspection, or Class X or Class Y weighing.

9. Official Weight Sample. Sacks of grain obtained at random by or under the complete supervision of official personnel from a lot of sacked grain for the purpose of computing the weight of the grain in the lot.

10. Weighing On-Line. Sacks of grain randomly selected as the lot is being produced and weighed.

11. Pallet. A frame usually made of wood on which sacked grain is stacked and transported to a carrier for shipment.

12. Random Sampling. A process of selecting a weight sample from a lot whereby each unit in the lot has an equal chance of being chosen. Ordinary haphazard choice is generally insufficient to guarantee randomness. Devices, such as tables of random numbers, are used to remove subjective biases inherent in personal choice.

13. Warehouse Weighing. Sacks of grain randomly selected from a warehouse lot and weighed.